CLAIMS

1. A DNA that encodes a guanosine triphosphate-binding protein-coupled receptor, wherein said DNA is selected from the group consisting of the following (a) to (d):

(a) a DNA encoding a protein comprising the amino acid sequence of any one of SEQ ID NOs: 1 to 4 and 17 to 21;

(b) a DNA comprising a coding region of the nucleotide sequence of any one of SEQ ID NOs: 5 to 8 and 22 to 26;

(c) a DNA encoding a protein comprising the amino acid sequence of any one of SEQ ID NOs: 1 to 4 and 17 to 21 in which one or more amino acids are substituted, deleted, added, and/or inserted; and

(d) a DNA hybridizing under stringent conditions to the DNA comprising the nucleotide sequence of any one of SEQ ID NOs: 5 to 8 and 22 to 26.

2. A DNA encoding a partial peptide of a protein comprising the amino acid sequence of any one of SEQ ID NOs: 1 to 4 and 17 to 21.

3. A vector comprising the DNA of any one of claims 1 and 2.

4. A transformant carrying the DNA of any one of claims 1 and 2 or the vector of claim 3.

5. A protein or a peptide encoded by the DNA of any one of claims 1 and 2.

6. A method for producing the protein or the peptide of claim 5, said method comprising the steps of culturing the transformant of claim 4 and recovering an expressed protein or peptide from the transformant or culture supernatant thereof.

7. A method of screening for ligands that bind to the protein of claim 5, said method comprising the steps of:

(a) contacting a test sample with the protein or the peptide of claim 5; and

(b) selecting compounds that binds to said protein or said peptide.

8. A method of screening for compounds that have activity of inhibiting the binding between the protein of claim 5 and a ligand thereof, said method comprising the steps of:

(a) contacting the protein of claim 5 or a partial peptide thereof

with the ligand in the presence of a test sample and detecting a binding activity of said protein or said partial peptide with said ligand; and

(b) selecting compounds that reduces the binding activity detected in step (a) as compared with a binding activity detected in the absence of the test sample;

9. A method of screening for compounds that inhibit or enhance activity of the protein of claim 5, said method comprising the steps of:

(a) contacting a ligand of said protein with cells expressing said protein in the presence of a test sample;

(b) detecting an alteration in the cells that results from binding of said ligand to said protein; and

(c) selecting compounds that suppress or enhance the alteration detected in step (b) as compared with an alteration detected in the cells in the absence of the test sample.

10. The method of claims 8 or 9, wherein the alteration in cells is a change in cAMP concentration or calcium concentration.

11. An antibody binding to the protein of claim 5.

12. A compound isolated by the method of any one of claim 7 to 10.

13. A pharmaceutical composition comprising the compound of claim 12 as an active ingredient.

14. The pharmaceutical composition of claim 13, wherein said pharmaceutical composition is formulated for the treatment of a disease selected from the group consisting of cancer, cirrhosis, and Alzheimer's disease.

15. A polynucleotide comprising at least 15 nucleotides, wherein said polynucleotide is complementary to the DNA comprising the nucleotide sequence of any one of SEQ ID NOs: 5 to 8 and 22 to 26 or a complementary strand thereof.

16. A method for diagnosing a disease selected from the group consisting of cancer, cirrhosis, and Alzheimer's disease, said method comprising the steps of detecting expression of the DNA of claim 1 in tissues related to the disease derived from a subject, or mutation in the DNA of claim 1 in the subject.

17. An agent for diagnosing a disease selected from the group consisting of cancer, cirrhosis, and Alzheimer's disease, said agent comprising the antibody of claim 11 or the nucleotide of claim 15.